Constructing Meaning in the Disciplines: Reconceptualizing Writing across the Curriculum as Composing across the Curriculum

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Writing has often been characterized as having special powers as a tool for promoting learning, as evidenced by the belief that "writing across the curriculum" should be established as a means of promoting thinking in all disciplines, even those in which a written product is not historically valued or useful. Theory and research in semiotics and multiple intelligences provide the foundation for an alternative view supporting the notion of composing across the curriculum, with a "composition" referring to any text that is culturally appropriate to the discipline and participants. Research on artistic response to literature, furthermore, questions the extent to which writing ought to be privileged even in language arts classes in which writing has traditionally been the primary means of mediation and assessment. This article ultimately argues that educators ought to question the privileged status of the textual forms that they allow students to produce and consider the potential of other acts of composing for enabling students to develop thought.

Janet Emig's (1977) characterization of writing as "a unique mode of learning" has influenced theory and instruction in English, composition, and other disciplines since the 1970s. Under the assumption that writing has a special capacity for promoting learning, Applebee (1981, 1984) and others have championed the "writing to learn" movement, which assumes that by engaging in the process of writing, learners develop thought "at the point of utterance" (Applebee 1981, p. 100). Writing, more than other psychological

tools, is believed to have such unique and inherent potential for developing thought that "writing across the curriculum" is believed by many to be the solution to underdeveloped thought among students in all disciplines (Comprone and Jones 1993).[1] Writing-across-the-curriculum programs based on this premise attempt to incorporate increased writing into a wide range of disciplines because, the argument goes, the process of writing can help learners develop thought regardless of the content area. Writing, therefore, is regarded as a tool with the capacity to promote thinking across the curriculum, even in disciplines in which a written product is not the standard medium of communication and representation.

The status of writing as a unique and primary mode of learning is reflected in the way the terms "writing" and "composition" have become synonymous. The journal *College Composition and Communication* and the annual spring conference that shares its name, for instance, are devoted exclusively to writing. College composition courses are really courses in the theory and practice of writing. A "text," to those subscribing to writing-to-learn maxims, is virtually synonymous with a piece of writing (Witte 1992). With these assumptions firmly entrenched among many writing researchers, theorists, and practitioners, writing across the curriculum becomes an obvious and logical solution to the problem that students in all content areas are not thinking sufficiently in their academic course work.

These assumptions stem in part from research that demonstrates that writing can indeed mediate thinking, particularly when knowledge is task-specific or discipline-specific (e.g., Durst [1987]; Greene [1993]; Langer and Applebee [1987]; Marshall [1987]; Newell [1984, 1994]; Witte and Cherry [1994]; see Smagorinsky and Smith [1992] for an account of knowledge specificity in writing and literary understanding). Marshall (1987) and Newell (1994), for instance, have investigated the ways in which writing can serve to mediate student analyses of literature, particularly when teachers use between-draft dialogue-oriented

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feedback to guide revisions (Newell 1994). In such studies the relationship between the content and process of writing is critical, with the process varying depending on the writer's purposes, the substance of the written expression, and the social context of writing.

The idea that writing has exclusive and inherent potential as a mediational tool for developing thinking for all people in all contexts, however, appears quite brittle when examined from broader theories of learning and communication than have thus far informed much writing theory. Taking a sociocultural perspective, Ackerman (1993) has challenged the notion that writing in and of itself serves as a tool to promote learning (see also Penrose 1992). He argues that while writing can potentially serve as a medium for the development of thought, it can do so only in the midst of a multifaceted restructuring of teachers' conceptions of learning and schools' organization and values. Simply imposing the idea of writing-to-learn activities on classrooms without changing the overall instructional environment, he argues, will not result in the great advances in learning claimed by advocates of the pedagogy. To Ackerman, the writing-to-learn activities themselves are but one part of a complex set of values and teeming social transactions that lead to the success of process-oriented approaches to learning.

A second challenge to the idea that writing across the curriculum should have privileged status as a psychological tool for the development of thought comes from theories based on semiotics and multiple intelligences. These theories question the extent to which any single sign system or type of intelligence has an inherent supreme capacity to promote the construction of meaning. Educational theories based on semiotics and multiple intelligences refer to the potential, rather than incarnate, capacity of different tools or sign systems to enable the construction of meaning. Rather than saying that a single mode of expression—writing, for instance—should promote learning across the curriculum as argued by Fulwiler (1987), Gere (1985), and others, semiotic theorists forward the idea that cultural tools for mediating thought and activity in particular situations become sanctioned according to the values and accepted genres of the discipline in which they are employed. From such a perspective, the issue is not that all disciplines should embrace writing as a unique mode of learning. Rather, each discipline should endorse the notion that meaning construction is the goal of learning, with the specific medium of meaning construction determined by the historical values of the discipline and the consensus of the participants in the transaction. With meaning construction as the goal, the value shifts from endorsing writing as a unique mode of learning to identifying the appropriate medium of

communication so that learners can compose an appropriate text in given situations in order to construct meaning. The characteristics of the text and the process and tools of composition will vary according to the values of the discipline and the genres appropriate and acceptable to the participants (Ackerman 1993; Harste et al. 1984; Lemke 1988; Nystrand et al. 1993; Smagorinsky and Coppock 1994*a*, 1994*b*, in press *a*; Witte 1992).

The notion of meaning construction, while frequently invoked in discussions of teaching and learning, often escapes definition (Smagorinsky 1986). I have previously defined meaning construction in response to literature as an act "in which a reader engages in a transaction with the signs of a text in order to initiate a personal transformation through constructive social activity" (Smagorinsky and Coppock 1994*a*). I would like to build on that definition by stressing that meaning construction involves tool use as the means through which learners mediate thought and activity (Wertsch 1985, 1991). People construct meaning through what Wertsch (1985) describes as "goal-directed, tool-mediated action" (p. 207) that serves a developmental purpose in the production and interpretation of semiotic signs. Such activity enables what Csikszentmihalyi and Larson (1984) call the "flow" of learning, when people reach new stages of complexity through tool-mediated action that is intentional, intrinsically motivated, and autotelic and that involves similar degrees of challenge and skill.

A given tool does not necessarily enable a learner to construct meaning through sign production or interpretation; rather, it provides a potential for doing so. To use writing as an example, a person may or may not value writing as a mediational tool, and the context of learning may or may not sanction writing as a tool; writing can serve a mediational purpose when the confluence of writer and situation makes it valuable as an appropriate means of mediation. Thus, Wertsch's idea that activity must be goal directed refers to the volitional nature of tool use: A tool can be used in many ways, not all of which are congruent with a learner's goals. Writing, for instance, can come in many forms, each being differently valued by or useful to writers in different contexts. In order to respond to literature, for instance, a learner ideally has many written options, including keeping a journal, retelling the story from a different narrative perspective, writing a five-paragraph theme, or producing a text with some other form and expressive purpose; in a different situation that same writer might choose a different form of expression, such as when wishing to complain of a hike in the sewer rate. Applebee (1981, 1993) has documented the ways in which schools privilege analytic writing over other functions and constrain student expression through their imposition

of analytic form, a form not always valued by students. The degree to which a particular tool enables meaning construction, therefore, depends on the disposition of the learner and the prevailing communication genres of the learning context (Smagorinsky and Coppock 1994*a,* in press *a*).

To return to the theme of this article, in schools many people believe that writing is the tool through which meaning is best constructed by all students in all disciplines. I am offering two propositions to challenge this assumption, both of which are expressed from the perspective of the student learner who is usually at the mercy of institutional forces. One is that writing-to-learn proponents are parochial in insisting that writing should be the primary means of meaning construction across the curriculum: that other composing processes are more appropriate to the construction of meaning in other disciplines. The other is that in English classes, writing should be one of many types of composition allowed for the construction of meaning: that the composition of other kinds of texts (music, art, dance, drama) can potentially enable students to construct meaning in ways similar to those that have been widely claimed and sometimes documented for writing.

The argument is somewhat paradoxical in that I am at once arguing that disciplinary conventions are important determinants of which type of text is appropriate for composing in given content areas and that teachers of English should reconsider the limitations of the specific generic constraints that they impose on their students by confining composing to writing. The resolution of the paradox comes through my belief that teachers in all disciplines should reconsider the extent to which any single textual medium should have privileged or exclusive status as a vehicle for constructing meaning in their content areas. Historical values should be part of that consideration, as should perspectives from unconventional angles. In order to analyze the appropriateness of textual media in the construction of meaning, I will first provide a review of the psychological research on semiotics and multiple intelligences that supports a broadened notion of text. Next, I will report my own preliminary research on the construction of nonprint texts in disciplines other than English. Third, I will review studies I have conducted on the production of nonwritten texts in English classes. Taken together, this research suggests that an exclusive focus on writing as a mode of learning limits, rather than enables, students to construct meaning across the curriculum and that students would benefit from having more flexibility in the media through which they express and develop their understanding of conceptual knowledge in school.

Psychological Theories

Semiotics

To say that semiotics provides the basis for a perspective on composing is somewhat deceptive, given that the term "semiotics" itself is a sign to which many meanings are imputed (Lemke 1993). My own view of semiotics emerges from a Peircean (Hartshorne and Weiss 1931–58) conception articulated by Bakhtin (1981), Halliday (1978), Wertsch (1991), Witte (1992), and others in which any given sign—whether linguistic, musical, imagerial, or other form—takes on meaning through constructive acts on the part of the perceivers. Signs (such as texts or the individual parts that constitute them) are therefore not fixed objects but "sites of an unfolding process of negotiation and contention over meaning among conversants. . . . Texts function dialogically to mediate the respective interests and understandings of their users" (Nystrand et al. 1993, p. 297). A written text, in this view, does not have a fixed meaning. Meaning is constructed through a reader's attribution of significance to the signs of the text. Even members of a distinct community, such as language arts educators, can instantiate different conceptions to a single term; the phrases "whole language," "student-centered instruction," "writing process," "traditional methods of instruction," and others bring a vast array of meanings to mind among diverse educators based on the culture of their own learning and the individual experiences they have accumulated.

The same sort of interpretation takes place when "readers" perceive the signs of nonwritten texts. Art, for instance, presents spatial configurations of signs that beholders perceive and to which they attribute meaning. From a semiotic perspective, any sign system has the potential for offering a pattern of signs for creators to suggest and perceivers to interpret. Witte (1992), among others (e.g., Harste et al. 1984; Lemke 1988; Suhor 1984), has argued that a text consists of "any ordered set of signs for which or through which people in a culture construct meaning" (p. 269). Emig (1977) and others have argued that among sign systems, writing has unique powers for enabling the construction of meaning through the production of linguistic texts. Witte and others have questioned whether writing's supremacy comes through its inherent powers or its privileged status (cf. Smagorinsky and Coppock 1994*a*, 1994*b*, in press *a*; Wertsch 1991).

Wertsch (1991) argues that the potential of particular psychological tools or mediational means for enabling learners to construct meaning is situational. He maintains that rather than having inherent superior-

ity, some mediational means are privileged in given contexts; in partic-
ular, analytic writing is typically privileged in school settings as the
most appropriate means of mediating a person's thought and activity.
The relative status of a particular psychological tool comes through
its perceived place in a hierarchy based on power or applicability.
According to Wertsch's view of the relative value of psychological tools,
some are "viewed as being more appropriate or efficacious than others
in a particular sociocultural setting" because they "strike their users
as being appropriate or even . . . the only possible alternative, when
others are, in principle, imaginable" (p. 124).

   Wertsch (1991) argues that people are equipped with a host of tools
for mediating thought and activity, writing and speech being but two.
He argues that people in their daily social transactions employ a tool
kit of means for constructing meaning, rather than a limited set of
linguistic tools; for schools to limit access to just a few of these tools
ignores the complexity of human behavior and the diversity of ap-
proaches people have to solving problems. Extending the metaphor,
Smagorinsky and Coppock (1994a, in press a) argue that people can-
not simply carry the tool kit about and use the tools therein indiscrimi-
nately; rather, the value of the psychological tools comes through the
way in which they are culturally sanctioned in particular situations.
So, while a tool such as musical composition might be a culturally
valued means for interpreting literature in one context (i.e., Tchaikov-
sky's musical score for *Romeo and Juliet* is valued in musical and theatri-
cal circles), the same tool is typically not valued in English classes,
which value writing as a mode of interpretation. The question raised
by Wertsch and others is, If the tool enables the development of psy-
chological growth in a learner—that is, if composing music effectively
interprets a story and leads to the construction of a meaningful inter-
pretive text—why is it less valued in the institution of school than
other tools (such as writing) that tradition has sanctioned as having
unique powers? What is preventing educators, as Wertsch would ar-
gue, from imagining other alternatives?

Multiple Intelligences

Gardner's (1983) theory of multiple intelligences complements semi-
otic theory in questioning the privileged status of writing in schools.
Gardner has argued that schools are very limited in what they accept
as legitimate means of expression. Except in special courses such as
art classes, schools privilege thinking and expression that are linguistic

and logical/mathematical. Applebee (1981, 1984) has documented the way in which most school writing is informational or analytic, illustrating Gardner's assessment of the limitations of what schools treat as legitimate ways of thinking. Gardner maintains that such a focus denies the rich array of intelligences that people employ to fashion products or solve problems in their daily lives and in their professional work and the diversity of ways of thinking that have been valued across time and cultures.

In addition to the linguistic and logical/mathematical intelligence that dominate school assessment, Gardner identifies five additional types of intelligence: musical, spatial, bodily or kinesthetic, interpersonal, and intrapersonal. Musical intelligence includes both the capacity to organize and perform sound and the ability to appreciate the nuances of performance. Spatial intelligence refers to the ability to configure space and determine spatial patterns, as when architects design buildings or billiards players determine the angles on a table. Bodily or kinesthetic intelligence is applied by dancers, hunters, and others who must use their bodies to express ideas or solve physical problems. Interpersonal intelligence, used by effective teachers, therapists, salespeople, and the like, involves understanding the moods and needs of other people. Intrapersonal intelligence refers to the capacity to look within to understand the self, as exhibited by many who undertake therapy or benefit from keeping journals. Most human activity involves some combination of intelligences; an artistic painter, for instance, often must see into the human condition for inspiration, must arrange images on the canvas spatially, and must produce the images kinesthetically.

Gardner (1983) challenges the entrenched values of schools that place a premium on logical and linguistic thinking. He provides innumerable examples of culturally valued behaviors that involve neither: sailors who navigate ships at night by reading the configuration of stars, dancers who use their bodies to create spatial representations of the human spirit, and other types of expression or problem solving in countless occupations across time and culture. On a more mundane level, we see teachers reading the dispositions of their students, parents being sensitive to the needs of their children, football players remembering complex formations and spontaneously determining the appropriate angles for execution, people arranging furniture for effective traffic patterns, and many other intelligent behaviors. Gardner argues that if such thinking is part and parcel of everyday life and central to expertise and success in many professions, it should not be devalued in terms of school assessment.

Composing Nonwritten Texts across the Curriculum

I have thus far reviewed psychological theories that justify a reconceptualization of how students construct meaning across the curriculum. That reconceptualization is based on questions raised about the exclusive powers of writing for promoting learning. If, as Ackerman (1993) has argued, writing in and of itself does not promote learning but is simply part of an overall shift to process-oriented classrooms, and if other psychological tools have the same potential for promoting learning as writing does, then educators must reconsider writing's privileged status in schools. Wertsch (1991) has argued that one of the main reasons that certain tools become institutionally privileged is that the participants become socialized to believe that they have no alternatives. Wertsch compares educators' and students' belief in the efficacy of many schooling practices with most typists' belief in the efficacy of the configuration of letter keys on the QWERTY keyboard. Yet Wertsch explains that this keyboard was actually designed to slow down a fast typist so as not to jam the keys on the original elephantine typewriters. Wertsch argues that once a practice such as using the QWERTY keyboard becomes institutionalized, people accept it as the best possible convention long after it has become outmoded through changes in technology, beliefs, needs, social conditions, and other considerations.

In this section I will attempt to imagine alternatives, as Wertsch (1991) would say, to existing practices of schooling by providing examples of nonwritten compositions produced across the curriculum, through which learners construct meaning in ways often attributed exclusively to writing. The illustrations come from exploratory research into the ways in which students construct meaning across a high school curriculum. I will review my observations of three types of classes that draw little attention from educational researchers: an agriculture course in equine management and production, a home economics course in interior design, and an industrial arts course in architectural design. In each class the students engage in long-term construction of functional models of living areas. The composition of the models is collaborative, with considerable attention to process and feedback throughout the design and production. Students must draw on a variety of disciplines, including geometry, physics, engineering, and mathematics and synthesize knowledge from those areas with content knowledge in the course at hand to produce a successful product.

In accordance with Wertsch's (1991) argument about the values of schooling, each of the three teachers in the courses studied remarked that their courses were not highly regarded by teachers in "intellectual"

disciplines such as English. As semiotic reinforcement for their feeling of marginalization, each class was on the physical fringe of the school campus, the agriculture course even being taught in a remote structure separate from the main academic building where students studied mathematics, English, and history. The interior design teacher said that other teachers in the building equated the home economics courses with basket weaving, a clear statement of the institutional value placed on the work of their course. Yet students in her class participated enthusiastically in the construction of a complex text, that being the design of a floor plan for an entire house. The following sections review the process of composition in each of the three classes.

In the equine management and production course students learn the range of knowledge and skills needed to maintain horses. Students come to class with calculators to determine the constitution of the feed mixes necessary for horses of different breeds, sizes, and purposes. Students learn the intricacies of breeding, exercise, and other aspects of horse maintenance. Throughout the semester they study the needs and habits of horses so that they can care properly for animals that they might own and maintain.

The culminating project for the semester is for students to synthesize all of their knowledge of horses in the design of a horse ranch that they might conceivably own some day and that will operate at a profit. The project takes roughly a month of class time, during which the students have access to one another's knowledge, the counsel of the teacher, and the resources of the classroom. The process of composition is thus highly social in the manner described by Vygotsky (1978, 1987) in his postulation of the zone of proximal development, which is the range of potential a person has for learning facilitated by psychological tools of mediation including speech, computing devices, drawing, and other means (see Moll [1990] and Smagorinsky [1994] for extended discussions of the role of mediational tools in extending the zone of proximal development). Students in the class begin the project with a conception of what breed of horse they want to manage, what type of work those horses will do, and where the facility will be located; these conceptions often coincide with the real goals of students in the class, many of whom own horses and live on ranches. Their conceptions develop over time through interaction with the social and material tools of mediation provided in the classroom and through their growing knowledge of the relationship between a horse's needs and the environmental structure needed to provide a healthy life for the animals.

Every student's model is different because every student sets up a slightly different problem. The form of the facility follows the function

of the situation. Different breeds of horses require different types of spaces for eating, exercising, breeding, and other activities. Different landscapes make different demands on the designer of a facility. The climate of the region affects decisions; in a region frequently hit by tornadoes, for instance, the facility should be built as low to the ground as possible.

In order to compose such a text, students need to draw on and synthesize a great deal of knowledge about horses, materials, weather, and other factors. Their content knowledge, therefore, determines the form their compositions will take. Students rely primarily on spatial intelligence in order to design their facilities, with economy of movement affecting the expenditure of energy of both horses and ranch hands and thus affecting the profit at which the ranch will operate.

Through their production of the horse facilities, students are engaged in an extended process of composition, mediating and developing their evolving text through the supportive social environment of their classroom. "At the point of utterance" they need to make a number of decisions, trying out and modifying configurations as they see them taking material shape. The signs of the texts they create reveal a great deal to those who maintain horses; the length of the runway that connects the stalls, for instance, suggests the breed and duties of the horses. Rather than being simply the product of a semester's learning, the model horse facility is a composition that takes shape through an increased understanding of concepts at the point of production, enabling the learners to engage in volitional activity that results in the growth in complexity characteristic of meaning construction.

Similar processes take place in the extended composition of texts in the architectural design and interior design classes. The two classes overlap: the teachers of the courses stay in close contact, the classes frequently have cross-enrollments, and the students are able to coordinate their work for the two classes (i.e., they may build a model house for the architectual design course and furnish its rooms for the interior design course). Both classes, like the equine management class, are informal and involve almost continual talk among students as they work on their projects; students are encouraged to get feedback at every stage of production from both teachers and peers and are encouraged to seek help outside class from parents, construction engineers, and interior decorators.

In the architectural design class the students' primary goal is to prepare the floor plans for and construct a model of a 1,200–1,800-square-foot home that must include a minimum of one full bath, a kitchenette, two bedrooms, and a two-car garage. Students must design

the home down to the smallest detail, including the placement of light switches; they must take into account the cost effectiveness of the materials they choose for their construction. Most students have external audiences for their products, such as judges in the competitions that they are encouraged to enter.

In order to build their homes the students must incorporate knowledge of mathematics, physics, engineering, geometry, and other disciplines. They must take into account the climate in which the home will be built, considering such factors as how to pitch the roof to account for expected amounts of snowfall. Above all, the homes must be functional; students must determine who will live in the house and how the layout will meet the inhabitants' needs. Typically, their hypothetical residents are themselves, which causes students to give great thought to their own living needs and the relationship of those needs with the materials and spatial configuration of the home. Students must consider the placement and shape of closets, the routing of ductwork and electrical wiring, and all other aspects of house design. The spatial text that they compose becomes meaningful in that the students must create an area that will support the ways in which they want to conduct their lives, and in the process they must consider whether they want to have a family, read books in a quiet study, entertain large groups of people, cook elaborate meals, and/or engage in other pursuits that will influence the design of the home.

Design of the model house takes place through the course of the semester; students are in a continual state of drafting, with each plan graded throughout the course. Students have steady access to one another, the teacher, and all of the resources of the classroom and in addition are encouraged to study existing homes and construction sites. Students are thus involved in a lengthy process of composition mediated by the tools provided through the zone of proximal development of their classroom and community.

The interior design class shares a similar concern with, as the teacher said, "being able to move things around in space." Students must take into consideration line design, color, proportion, a sense of rhythm and balance in a room, and other factors that make a room attractive and functional. Students are responsible for building a "dream home" that fits a defined lifestyle that students identify through an early written consideration of their career plans, their marriage and family plans, and their hobbies and interests. They then design the interior of their home around those thoughts and feelings. Their ultimate composition is a floor plan that they decorate with sample swatches.

The home, according to the teacher, needs "to be comfortable, to be useful, to be a good place to be." In order to make the home a

good place to be, students engage in a process of meaning construction by seeking a relationship between their own needs and dispositions and the semiotic structure of the environment in which they will live. To establish this relationship, students need to learn content information about functional spatial design and thus engage in such preliminary projects as redesigning a faulty kitchen. Through such instruction students learn the effects of different spatial configurations and how to match different effects with different needs.

In all tasks students may work collaboratively, although each student must turn in an individual project. Like the architectural design students, the interior design students frequently work outside class to increase their expertise, going to furniture and hardware stores to examine and bring to class samples of tile, wallpaper, and other materials. Like the architecture and equine management classes, the course involves a lengthy process of learning and composition with the semester's work synthesized in the design of a single, functional product. According to the teacher, "It's not a class where you say, well, turn it in at the end of the hour. It's an ongoing project. It's started from the first day of class, it's not a project you can finish next week or next month. It can just keep on building. I don't know that there's really an end to it."

In all three of these classes, students are engaged in a long-term process of composition, producing numerous drafts that change and develop as their conceptual knowledge increases and as their goals evolve. They are producing texts that are personally meaningful to them in that they are creating models that represent the type of space they need to express and conduct themselves. The students work in a highly social atmosphere, giving and receiving continuous feedback to aid one another's development through their zones of proximal development. Through the process of composition they learn not only content knowledge (such as the most efficient way to route heating ducts) and cultural knowledge (such as the implications of different lighting systems in a home) but personal knowledge as well, such as what breed of horse they prefer, how their kitchen layout will serve their particular patterns of behavior, and how their choices of color and pattern will represent their distinct personalities.

In these classes, students are composing texts that enable them to construct meaning. Although at times writing facilitates their thinking about their projects (as when the interior design students start with an essay about their lifestyle needs), the historically situated genres of the disciplines call for spatial models, rather than written texts, as the optimal mode of expression and representation. With the process of composition yielding the same benefits typically attributed to writing,

the experiences of these students suggest that writing, rather than being a unique mode of learning, is instead one mode of learning that has greater potential for developing thought in some arenas than in others.

Nonwritten Compositions in English Classes

In the previous section I described a number of compositional forms that are culturally appropriate to disciplines other than English; these media provide much the same potential as that attributed to writing in promoting learning. In English classes the privileged medium of communication and mediation is writing. In a set of case studies conducted at an alternative school for recovering substance abusers (Smagorinsky and Coppock 1994a, 1994b, in press a, in press b, in press c), however, we have found that in some language arts activities the composition of nonwritten texts can provide the same sort of learning attributed to writing and for some students may be more culturally appropriate media for constructing meaning (Smagorinsky 1991, 1992, in press).

The research project was to investigate the processes involved when students from an alternative school for recovering substance abusers composed artistic texts in response to literature. Following their reading of William Carlos Williams's "The Use of Force," the students worked either alone or in groups of up to five to create a product that represented their response to the story. The room had been stocked with paper, writing and drawing supplies, Tinkertoys, musical instruments, and a computer with a graphics program; in addition, the students lived at the facility and could go to their rooms to get additional materials. Students experimented with a number of media, with several individuals and groups exploring musical interpretations, several creating various artistic renditions, one group dramatizing the action of the story, and another pair choreographing a dance depicting the relationship between the two central characters.

Four sets of students were selected for study, and their behavior was videotaped to allow a retrospective interview about their composing processes (see also Bloom 1954; DiPardo 1994; Rose 1984). The interviews revealed that the students had at once engaged in several processes attributed to writing and in addition—because of the different potentials of the chosen media and unique characteristics of the individuals—engaged in processes quite different from those available through writing. In all of the case studies, the students learned through the process of composing their texts; in other words, at the point of

production their thinking developed about the problem they were trying to solve. This process is therefore dialectic (Vygotsky 1978); that is, the learner's thinking shapes the text under production and is simultaneously shaped by the process of producing the text.

Students from each case study reported drawing on personal experiences to compose their texts. One young woman who participated in the choreographed interpretation played the role of the girl in the story who must be examined for diphtheria by a doctor making a house call. The story takes place during an epidemic, and the girl, her parents, and the doctor all fear that she will yield a positive throat culture and subsequently die. The girl battles the doctor's efforts to extract the culture, making him rely on the use of force to pry her mouth open and examine her tonsils. Martha, the young woman who played the role of the girl, reported in her interview that she empathized heavily with the girl; that she, too, hated to have people look inside her and get to know her. She said that she hated going to the dentist and having him open her mouth to look inside and, just like the girl in the story, often fought the dentist's efforts to look within her. Martha's portrayal of the girl through her role in the dance, then, was informed by tremendous fears similar to those experienced by her character. The experience of kinesthetically playing out those fears through her participation in the dance represented the composition of a personally meaningful spatial text, one that revealed both an understanding of the story and an infusion of personal meaning into the written signs of the story. Her process of composition revealed the process of "interinanimation" (Rosenblatt 1978) that readers experience with literature when participating in an aesthetic response.

Another student, Dexter, drew a picture to represent the relationship between the doctor and the girl (see fig. 1). Among his response processes was the situation of his artistic text in an intertext (Bloome and Bailey 1992); that is, he drew on the image he had retained from a film he had seen, the rock group Pink Floyd's *The Wall*, to create the perspective of his drawing. When asked whether he had copied the perspective directly from the film, he replied that he had not; rather, he said, "It came through my mind." He thus appropriated the perspective from a prior text in order to create the perspective for his own production.

Jane and Martha, the dancers, also created spatial relationships in order to depict their understanding of the story. Jane reported that they represented the adversarial relationship between the doctor and girl through their positioning relative to one another: "When the doctor is trying to get her around to his way of thinking, we figuratively did it by going around in circles opposite each other." Jane and Martha
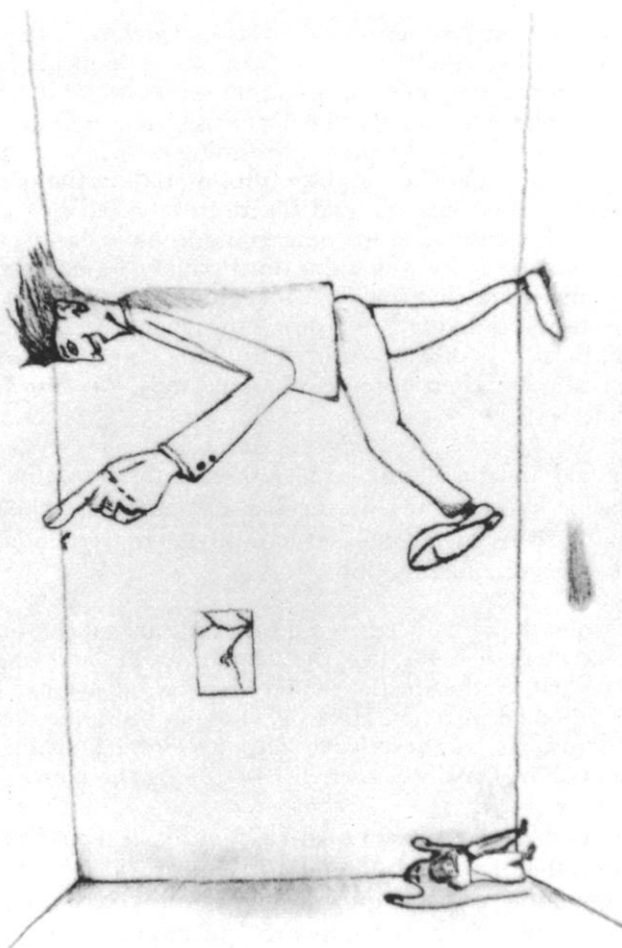
FIG. 1.—Dexter's drawing (original size 11 × 17 inches)

also created spatial relationships to depict the characters' emotional states during the story. In order to do so, they needed to reconstruct the story line. In Williams's text the story ends with the girl attacking the doctor in a blind fury following his forcible extraction of the throat culture. Jane and Martha decided to represent the doctor's feelings rather than to strictly follow the story line:

> *Jane:* We did another dance at the very end and we were practicing on it and, like, she's sheltered, like, the little girl is hidden. She won't let anybody find out what her secret is and that's what she's doing. She is hiding and the doctor is trying to follow in her footsteps to try to figure out what is going on. And at the very end when it says that she did have [diphtheria], in the dance we made her die. She just fell and the doctor picked her up and carried her. Because, like, we were going to have the doctor die with her because it was, like, the third patient he had died and he was dying inside, but [our teacher] didn't really like that. And after we started thinking, you know, how he gets underneath the skin real hard, it is, like, we started thinking about it too and he doesn't really die. He tries to help her and stuff. We went further than the story went.

Here Jane and Martha attempted to represent the figurative death of the character by physically having her die. After their teacher's intervention they constructed another figurative representation of the story's ending, as described by Jane:

> That is when they finally figured it out. It is, like, at the very end they walked together. It's, like, they walk two steps and when you do a little pause, the doctor shelters her and just looks at her because he's died with her. His whole life has just gone down the drain because it's another kid, he feels it's all his fault this time. And that is how I really felt when I was doing the dance.

In composing their own interpretive text they focused on the characters' emotions rather than on the literal story line provided by Williams. Their representation of the emotional story required them to rewrite the ending and represent it through spatial relations. Their composition of their choreographed text, then, enabled them to play out the emotions of the characters in ways not available through writing.

A group of four boys approached their interpretation quite differently. They used a sophisticated keyboard instrument to compose a soundtrack that represented the changing moods and rhythms of the story. None of the four was a trained musician; the keyboard, however, provided such a great range of potential sounds and dubbing capabili-

ties that even a person with rudimentary knowledge could program it for a soundtrack. The boys reported that their musical accompaniment was intended to represent the story line:

> *Cory:* They had this funky like Star Trek sound going on and I said, "This has nothing to do with the little girl not wanting to show her parents how she had the disease that could kill her, and they were like "r-r-r-r-r," and they had this funky sound on, and I was, like, you know, at first, you know, you need to have like a fight going, and then at the end where she was so enraged over—so enraged from defeat, that kind of mellowed out some because it, it would show the feelings and the end of defeat that the little girl was going through.
> *Interviewer:* So did you say that the loud part showed the rage?
> *Cory:* Yeah, and her struggling, you know, how, having a kind of an intense sound because of her struggling, not wanting to open her mouth, not wanting to let that, that doctor do a throat culture.
> *Interviewer:* Uh huh. And then the mellow sound was her—
> *Jake:* Defeat.

Most relevant to the current argument was the way in which the students' compositions served a dialectic function; that is, at once the texts represented the students' thinking about the story, and the process of composing the texts changed their thinking about the story. Jane, one of the dancers, reported that her feelings about the doctor changed through her portrayal of him:

> I finally figured out what it is like to be in the position of the doctor. That is why I didn't hate the doctor so much because I knew how he felt. . . . [I learned about] how the doctor felt. I knew his feelings, but knowing it and feeling it is totally different things. [I learned] about myself, that I can feel their feelings. I see how they feel.

The process of composing nonverbal texts also changed students' understanding of the story. Dexter related that the meaning of his drawing changed as his work on the picture developed. For instance, Dexter's representation of the doctor was quite threatening; yet he revealed that when he started his drawing he was not certain what the threatening figure would represent:

> *Dexter:* I wasn't really sure if it was him going to be the doctor or not until the end of the story, I mean, until the end of the drawing, because I was thinking, well, it could be this person that she, that she has imaged in her mind and uh—or this could be

> an analogy of diphtheria, but then I said it doesn't matter. It's just a doctor. It was going through her mind, [inaudible] but I liked to read. The first time I'd read the doctor; the second, the analogy. It's just through that one story.
>
> *Interviewer:* So you mean, even after you drew the face and everything, it wasn't the doctor yet?
>
> *Dexter:* Uh-huh. I mean it could have been a lot of things. It depends on your viewpoint of the picture, but what I was thinking is—it was the doctor and then it was an analogy of the whole attitude of the story, and then it was the, her parents' attitude, or the parents, especially her parents.

Dexter's attribution of multiple meanings to the dominant figure in the drawing suggests that when he created his own text, he ascribed meanings for the figure that he had not considered prior to having drawn it, meanings (such as the mother or a disease) that the graphic image itself does not readily suggest. Not only does the picture represent his view of the characters but the process of drawing the picture enabled him to develop new ideas about the story as well. The process is similar to the one that Applebee (1981) attributes to writing. Applebee argues that educators should consider

> writing as a tool for exploring a subject. . . . Writing can be a powerful process for discovering meaning rather than just transcribing an idea that is in some sense waiting fully developed in the writer's mind. Our language provides a whole panoply of devices that not only convey our meaning to others, but help us develop the meaning for ourselves. . . . We tend to overlook the extent to which these devices help us generate new ideas "at the point of utterance." (P. 100)

Also overlooked is the potential that other psychological tools have for enabling similar processes. As the experiences of these students illustrate, nonwritten texts are capable of providing the same potential for enabling the construction of meaning as written texts. Yet their production is rarely sanctioned in English classes. One might argue that, just as models of horse facilities are culturally appropriate to equine management and production courses, written essays are the historically sanctioned genre for constructing meaning in English classes. Yet the notion that written texts should be privileged is hollow. Throughout history artists have engaged in "transmediation" (Suhor 1984); that is, they have interpreted one type of text through another. Biblical scenes and stories have been interpreted through paintings, sculptures, masses, dances, and other media. Poets have written odes on Grecian urns and other works of art. Animators have interpreted

classical music through stories, as illustrated in the film *Fantasia*. And, of course, literary critics have written essays interpreting literature. The point is that all of these forms of transmediation have been cultur- ally valued as means of constructing meaning and have been respected and revered by the public as well as by the cognoscenti. The apprecia- tion of nonwritten interpretations of life and literature has rarely, however, broken through the barriers of the English classroom, where writing has established exclusive rights "as a unique mode of learning" (see Gill [in press] and Smagorinsky [1991] for exceptions). The re- search I have reported on students' artistic response to literature sug- gests that such a view is not simply wrong but potentially disabling to students as well.

Discussion

The research base that supports my argument, although exploratory, is sufficient to raise questions about the privileged status of writing as a vehicle for developing thought both in English classes and in other disciplines. Writing across the curriculum, as Ackerman (1993) has maintained, "is at best an argument yet to be made" (p. 335). Contin- ued research into the question of the appropriateness of multiple sign systems for the development of learning (e.g., Ackerman et al. 1993, 1994; Bussert 1993; Eisner 1993; Gehlbach 1990; Hanna 1987; Harste et al. 1984; Hatch and Gardner 1993; Medway 1993; Siegel 1984) suggests that it is an argument that will be very difficult to make given both the multitude of discipline-appropriate modes of composition and the multitude of culturally appropriate sign systems available to learners (Smagorinsky and Coppock 1994a, in press a).

With writing having questionable status as an exclusive mode of meaning construction, not just across the curriculum but in English classes as well, educators need to reconceptualize the means through which to accomplish the goal of promoting the development of thought across the disciplines. My proposal is to shift the emphasis from writing to composing. The processes engaged in by students in the equine management and production, architectural design, interior design, and alternative school classrooms all involved the composition of complex, meaningful texts that were culturally appropriate and situationally valued. In serving as tools for learning, the composition processes met the goals of writing-to-learn advocates even though they did not involve writing for the most part.

The question that presents itself is, Why is writing so highly privi- leged? Why do the home economics teachers refer to their courses

as being equated with basket weaving? Why do teachers in home economics, architecture, and agriculture, when asked what students need to know in order to be successful, say "common sense" rather than "intelligence"? Why are courses such as home economics, in which students make useful products that are important to them, located physically on the margins of schools? Why, as Wertsch (1991) asks, is the use of and value on alternative psychological tools so difficult to imagine in school settings?

Questions such as these will become increasingly crucial for educators to answer as schools become more diverse and as school values subsequently become more pluralistic and inclusive. Gardner (1983, 1993) argues that different intelligences are fostered by different cultures and that as schools become less dominated by students of Western descent, the focus on logical linguistic assessment will become a more questionable practice. Researchers such as Moll (1992) and Philips (1972), for instance, have found that ethnic minorities such as Mexican Americans and Apaches fail in school in large part because of cultural differences between their community-based communicative competence and that expected and evaluated in schools.

The effort to reconceive schools is often difficult and contentious. "Progressive" education has been with us for almost a century now and is still dismissed as newfangled balderdash by many educators and citizens (Cohen 1988). Implementing any type of program that threatens institutionalized values can result in community uprisings that threaten the careers of teachers and administrators (see, e.g., Flanagan's [1994] account of the implementation of a whole language curriculum in Peekskill, New York, which could just as well describe the efforts to implement many outcomes-based education programs nationwide). The research base for imagining alternatives to writing as the exclusive vehicle for constructing meaning is relatively slim considering the volumes of educational research produced each year, yet it is sufficiently compelling to raise questions about how we privilege specific sign systems even as they limit opportunities for all students to develop their potential. Writing-to-learn advocates have argued that writing has unique powers for enabling students to learn at the point of utterance; the research I have reviewed questions that assumption. Rather, any sign system that is culturally sanctioned has the potential to enable learners to engage in the construction of meaning through tool-mediated activity. Educators should be concerned with understanding the potential for learning available through the use of psychological tools to simultaneously create products and develop thought; to elevate one tool and sign system over all others for all purposes in all disciplines denies the variety of modes of learning and

expression that have characterized human development over time and across cultures.

Notes

1. I use the term "disciplines" broadly here to include all subject areas offered within a school curriculum. Susan Laird has pointed out to me that from some perspectives, course areas such as agriculture, home economics, and architecture (which I discuss in this essay) are not regarded as disciplines but rather as trades or vocations. Such a division suggests a difference in the values placed on these areas of practice, with trades often being physically removed from the academic subject areas by being placed in separate vocational schools. In the school reported on in this essay, the vocational classes were on the school grounds but housed either in remote wings of the school or separate facilities altogether; in addition, students could take related courses at a nearby public vocational/technical school.

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